

Curved Microchannel Plates for Spaceflight Mass Spectrometers, Phase I

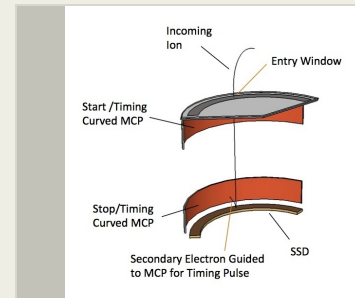
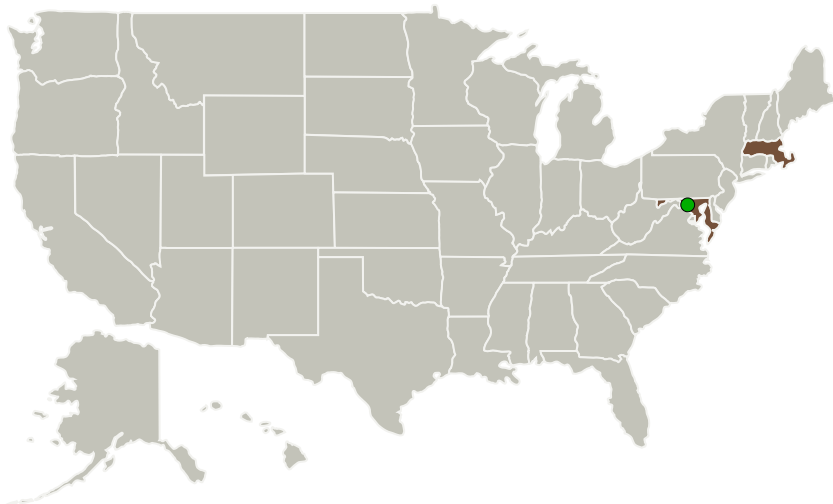
Completed Technology Project (2015 - 2015)



Project Introduction

This proposal will develop long, continuous, curved microchannel plates (MCPs) for use in spaceflight ion mass spectrometers. These instruments obtain ion mass in part by measuring the ion speed. Ions create secondary elections, first as they enter the instrument window, then as they ht a target. The flight time across the distance in between provides the speed. The time is measured by detecting secondary electrons from the window and then the target. Curved MCPs simplify the detection because: they have a cylindrical symmetry which is compatible with instrument fields of view; the MCP channels always have the same orientation to electron flight paths, and so create uniform azimuthal detection efficiency; and they may be placed close to the window and target, thereby improving time of flight and mass resolution. Curved MCPs will be developed starting with the successful Incom approach for flat MCPs. A glass capillary array is first formed with 20 micron pores. Using Atomic Layer Deposition, the array is then coated with thin films that create the desired resistance and gain.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Incom, Inc.	Lead Organization	Industry	Charlton, Massachusetts
● Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations	
Maryland	Massachusetts

Project Transitions

**June 2015:** Project Start**December 2015:** Closed out**Closeout Summary:** Curved Microchannel Plates for Spaceflight Mass Spectrometers, Phase I Project Image**Closeout Documentation:**

- Final Summary Chart Image(<https://techport.nasa.gov/file/138917>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Incom, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

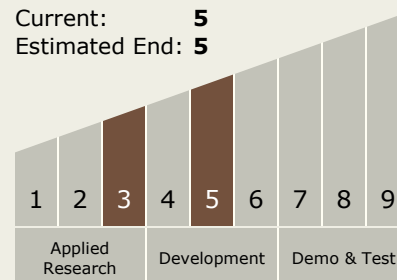
Carlos Torrez

Principal Investigator:

Mark Popecki

Technology Maturity (TRL)

Start: 3
 Current: 5
 Estimated End: 5

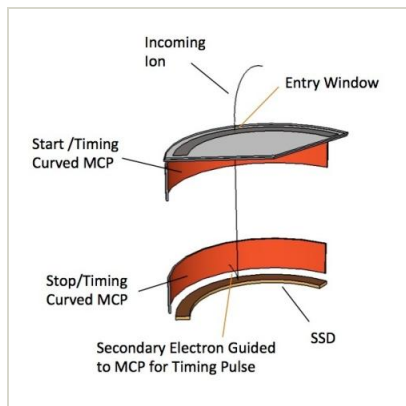


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Images



Briefing Chart Image

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(<https://techport.nasa.gov/image/126732>)

Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.3 In-Situ Instruments and Sensors
 - └ TX08.3.4 Environment Sensors

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System